

Caroline E. Farrior, Ph.D.

CONTACT INFORMATION	University of Texas at Austin Department of Integrative Biology 2415 Speedway Stop C0930 Austin, TX 78712, USA	<i>E-mail:</i> cfarrior@utexas.edu <i>Phone:</i> +1(512)232-6922 <i>Office:</i> PAT 506A <i>Website:</i> sites.cns.utexas.edu/cfarrior
PROFESSIONAL POSITIONS	University of Texas at Austin Austin, Texas, USA Department of Integrative Biology <i>Assistant Professor</i>	Fall 2016 – current
	NIMBioS Knoxville, Tennessee, USA National Institute for Mathematical and Biological Synthesis <i>Postdoctoral Fellow</i>	2014 – 2016
	Princeton Environmental Institute Princeton, New Jersey, USA <i>Postdoctoral Research Associate</i>	2012 – 2014
EDUCATION	Princeton University Princeton, New Jersey, USA Ph.D., Ecology and Evolutionary Biology (Advisors Simon Levin, Stephen Pacala)	2007 – 2012
	University of Pennsylvania Philadelphia, Pennsylvania, USA B.A., Honors in Biology, Minor in Mathematics	2003 – 2007
HONORS AND AWARDS	Early Career Fellow, The Ecological Society of America The American Society of Naturalists, Presidential Award National Science Foundation Graduate Research Fellowship Princeton Energy and Climate Scholar University of Pennsylvania, University Scholar	2021 – 2025 2014 2009 – 2012 2009 – 2011 2003 – 2007
PUBLICATIONS	Rakowski, C.J., C.E. Farrior , S.R. Manning, and M.A. Leibold. 2021. Predator complementarity dampens variability of phytoplankton biomass in a diversity-stability trophic cascade. <i>Ecology</i> doi:10.1002/ecy.3534. Phillips, Z.I., L. Reding, and C.E. Farrior . 2021. The early life of a leaf-cutter ant colony constrains symbiotic vertical transmission and favors horizontal transmission. <i>Ecology and Evolution</i> 11:11718–11729. Northup, A.P., T.H. Keitt, C.E. Farrior . 2021. Cavitation-resistant junipers cease transpiration earlier than cavitation-vulnerable oaks under summer dry conditions. <i>Ecohydrology</i> doi:10.1002/eco.2337. Crawford, M.S, K.E. Barry, A.T. Clark, C.E. Farrior , J. Hines, E. Ladouceur, J.W. Lichstein, I. Maréchaux, F. May, A.S. Mori, B. Reineking, L.A. Turnbull, C. Wirth, and N. R�uger. 2021. The function-dominance correlation drives the direction and strength of biodiversity-ecosystem functioning relationships. <i>Ecology Letters</i> 24(9):1762–1775. Reiskind, M.O.B, M.L. Moody, D.I. Bolnick, C.T. Hanifin, C.E. Farrior . 2021. Nothing in evolution makes sense except in the light of biology. <i>BioScience</i> 71(4):370–383.	

PUBLICATIONS
CONTINUED

Franklin, O., S.P. Harrison, R. Dewar, **C.E. Farrior**, Å. Brännström, U. Dieckmann, S. Pietsch, D. Falster, W. Cramer, M. Loreau, H. Wang, A. Mäkelä, K. T. Rebel, E. Meron, S. J. Schymanski, E. Rovenskaya, B.D. Stocker, S. Zaehle, S. Manzoni, M. Van Oijen, I.J. Wright, P. Ciais, P.M. van Bodegom, J. Peñuelas, F. Hofhansl, C. Terrer, N.A. Soudzilovskaia, G. Midjley, and I.C. Prentice. 2020. Organizing principles for vegetation dynamics. *Nature Plants* 6:444–453.

Rüger, N. Condit, R., D.H. Dent, S.J. DeWalt, S.P. Hubbell, J.W. Lichstein, O.R. Lopez, C. Wirth, and **C.E. Farrior**. 2020. Demographic trade-offs predict tropical forest dynamics. *Science* 368(6487):165–168.

Lu, Yaojie, R.A. Duursma, **C.E. Farrior**, B.E. Medlyn, and X. Feng. 2020. Optimal stomatal drought response shaped by competition for water and hydraulic risk can explain plant trait covariation. *New Phytologist* 225(3):1206–1217.

Farrior, C.E., 2019. Theory predicts plants grow roots to compete with only their closest neighbours. *Proceedings of the Royal Society, B.* 286:20191129.

Weng, E., R. Dybzinski, **C.E. Farrior**, and S.W. Pacala. 2019. Competition alters predicted forest carbon cycle responses to nitrogen availability and elevated CO₂: Simulations using an explicitly competitive, game-theoretic vegetation demographic model. *Biogeosciences* 16(23):4577–4599.

Beckage, B., G. Bucini, L.J. Gross, W.J. Platt, S.I. Higgins, N.L. Fowler, M.G. Slocum, and **C. Farrior**. 2019. Water limitation, fire, and savanna persistence: A conceptual model. In P.F. Scogings and M. Sankaran (Eds) *Savannas Woody Plants and Large Herbivores* Wiley. West Sussex, UK. 645–659.

Dybzinski, R., A. Kelvakis, J. McCabe, S. Panock, K. Anuchitlertchon, L. Vasarhelyi, M.L. McCormack, G.G. McNickle, H. Poorter, C. Trinder, and **C.E. Farrior**. 2019. How are nitrogen availability, fine-root mass, and nitrogen uptake related empirically? Implications for models and theory. *Global Change Biology* 25(3):885–899.

Fisher, R.A., C.D. Koven, W.R.L. Anderegg, B.O. Christoffersen, M.C. Dietze, **C.E. Farrior**, J.A. Holm, G. Hurtt, R.G. Knox, P.J. Lawrence, J.W. Lichstein, M. Longo, A.M. Matheny, D. Medvigy, H.C. Muller-Landau, T.L. Powell, S.P. Serbin, H. Sato, J. Shuman, B. Smith, A.T. Trugman, T. Viskari, H. Verbeeck, E. Weng, C. Xu, X. Xu, T. Zhang, and P. Moorcroft, 2018. Vegetation demographics in Earth System Models: A review of progress and priorities. *Global Change Biology* 24(1):35–54.

Weng, E., **C.E. Farrior**, R. Dybzinski, and S.W. Pacala, 2017. Predicting vegetation type through physiological and environmental interactions with leaf traits: evergreen and deciduous forests in an earth system modeling framework. *Global Change Biology* 23(6):2482–2498.

Farrior, C.E., S.A. Bohlman, S. Hubbell, and S.W. Pacala, 2016. Dominance of the suppressed: Power law size structure in tropical forests. *Science* 351:155–157.

Weng, E., S. Malyshev, J.W. Lichstein, **C.E. Farrior**, T. Zhang, E. Shevliakova, and S.W. Pacala, 2015. Scaling from individual trees to forests in an Earth system modeling framework using a mathematically tractable model of height-structured competition. *Biogeosciences* 12:2655–2694.

Farrior, C.E., I. Rodriguez-Iturbe, R. Dybzinski, S.A. Levin, and S.W. Pacala, 2015. Decreased water limitation under elevated CO₂ amplifies potential for forest carbon sinks. *PNAS* 112:7213–7218.

PUBLICATIONS
CONTINUED

Dybzinski, R., **C.E. Farrior**, and S.W. Pacala, 2015. Increased forest carbon storage with increased atmospheric CO₂ despite nitrogen limitation: a game theoretic model of carbon and nitrogen allocation strategies for trees in competition for nitrogen and light. *Global Change Biology* 21:1182–1196.

Farrior, C.E., 2014. Competitive optimization models, attempting to understand the diversity of life. *New Phytologist* 203:1025–1027.

Farrior, C.E., D. Tilman, R. Dybzinski, P.B. Reich, and S.W. Pacala, 2013. Resource limitation in a competitive context determines complex plant responses to experimental resource additions. *Ecology* 94:2505–2517.

Dybzinski, R., **C.E. Farrior**, S. Ollinger, and S. Pacala, 2013. Interspecific versus intraspecific patterns in leaf nitrogen of forest trees across nitrogen availability gradients. *New Phytologist* 200:112–121.

Farrior, C.E., R. Dybzinski, S.A. Levin, and S.W. Pacala, 2013. Competition for water and light in closed-canopy forests: a tractable model of carbon allocation with implications for carbon sinks. *The American Naturalist* 181:314–330.

*Received the American Society of Naturalists' Presidential Award for the best paper published in the journal in 2013

Dybzinski, R., **C.E. Farrior**, A. Wolf, P.B. Reich, S.W. Pacala, 2011. Evolutionarily stable strategy carbon allocation to foliage, wood, and fine roots in trees competing for light and nitrogen: An analytically tractable, individual-based model and quantitative comparisons to data. *The American Naturalist* 177:153–166.

SELECTED
INVITED
PRESENTATIONS

Behavior, Ecology, Evolution, and Systematics Seminar Series. University of Maryland. Zoom. 26 April 2021

Kellogg Biological Station, Michigan State University. Seminar Series. Zoom. 9 Oct 2020

German Center for Integrative Biodiversity Research (iDiv). Public seminar Series. Leipzig, Germany. 18 Dec 2019

Energy@UT, Mindbenders. Austin, Texas. 2 Oct 2019

Stanford University, Carnegie Institute. Palo Alto, California. 22 Oct 2018

University of Minnesota, Plant and Microbial Biology. St. Paul, Minnesota. *Graduate student invited speaker 20 Feb 2018

Pennsylvania State University, Department of Biology. State College, Pennsylvania. 31 Oct 2017

Rice University, BioScience Departmental Seminar Series. Houston, Texas. 2 Oct 2017

International Institute for Applied Systems Analysis. *Dynamic Vegetation Models: The Next Generation*. Vienna, Austria. 27 March 2017

National Center for Atmospheric Research *Ecosystem Demographics in the Earth System*. Boulder, Colorado. 19 Jan 2016

Wageningen University and Research Center. Wageningen, Netherlands. 12 Jan 2016

Utrecht University. Utrecht, Netherlands. 11 Jan 2016

Howard University, Department of Mathematics Colloquium. 25 Sept 2015

Umeå University. Umeå, Sweden. 12 March 2014

FUNDING	<p>Energy Institute of the University of Texas at Austin and ExxonMobil. co-Lead PI. <i>Linking plant strategies to complex subsurface hydrology to predict ecosystem carbon storage across Texas.</i> (\$572,346) 2020 – 2022</p> <p>National Science Foundation. PI. <i>EAGER: Explaining species coexistence from first principles of Ecology.</i> (\$299,993) 2019 – 2022</p> <p>Dr. Cecile Dewitt-Morette France-UT Endowed Excellence Fund, French Embassy. PI. <i>Leaf and wood dimensions: Understanding tropical forest diversity by integrating data and mechanistic models.</i> (\$22,989) 2019 – 2020</p> <p>National Science Foundation, Graduate Research Fellowship. (\$126,000) 2009 – 2012</p>
OTHER FUNDED ACTIVITIES	<p>German Center for Integrative Biodiversity Research (iDiv). Pantropical forest succession workshop. Leipzig, Germany. Three, week-long workshops 2019–2022. <i>Invited participant.</i></p> <p>Smithsonian Center for Tropical forest Science – Forest Global Earth Observatory. Annual Analytical Workshop, Brno Czech Republic. July–August 2018. <i>Invited participant.</i></p> <p>National Institute for Mathematical and Biological Synthesis. Ecology meets systems biology: Developing a pan-microbial trait-based framework for community ecology and ecosystem functioning. June 14–16, 2017. <i>Invited participant.</i></p>
TEACHING EXPERIENCE	<p>University of Texas at Austin Austin, Texas</p> <p><i>Instructor</i> Theoretical Ecology, Graduate Level Fall 2020</p> <p><i>Instructor</i> Ecology, Undergraduate Level Fall 2016, Fall 2017, Fall 2018, Fall 2020</p> <p><i>Co-Instructor</i> Subjects and Skills in Ecology, Evolution and Behavior II, Graduate Level Spring 2018, Spring 2019</p> <p>University of Tennessee Knoxville, Tennessee</p> <p><i>Guest Lecturer</i> Mathematical Ecology, Graduate Level Fall 2015</p> <p>Graduate Research Advising</p> <p>Charlotte Reemts, UT Austin Plant Biology 2021 – current</p> <p>Xinyi Yan, UT Austin EEB 2020 – current</p> <p>– co-advised by Amy Wolf</p> <p>Damla Cinoglu, UT Austin EEB 2019 – current</p> <p>Devin Grobert, UT Austin Plant Biology 2019 – current</p> <p>– co-advised by Norma Fowler</p> <p>Chase Rakowski, UT Austin EEB 2019 – current</p> <p>– co-advised by Mathew Leibold</p> <p>Alison Northup, UT Austin EEB 2016 – current</p> <p>– co-advised by Tim Keitt</p> <p>Shankari Subramaniam, UT Austin EEB M.A. 2019</p> <p>– Dissertation title: <i>Dispersal evolution in a community context</i></p> <p>Wenyng Liao, Princeton U., Visiting student 2018</p> <p>– Project title: <i>Competition for water and nitrogen in deciduous and evergreen plants explains the global pattern of symbiotic fixation along rainfall gradients</i></p> <p>Yaojie Lu, NIMBioS Graduate Student Fellow 2015</p> <p>– Project title: <i>Competitive stomatal behaviour</i></p>

TEACHING EXPERIENCE CONTINUED	Postdoctoral Advising	
	Tom Bytnerowicz, Stengl Wyer Scholar	2020 – current
	Robin Decker	2019 – current
	Dana Chadwick, Research Associate	2021 – 2021
	– (current position) Research Scientist, NASA Jet Propulsion Laboratory	
	Emily Francis	2019 – 2021
	– (current position) Postdoc, Hurteau Lab, University of New Mexico	
	Claire Fortunel	2017 – 2018
	– (current position) Research Scientist UMR AMAP IRD, Montpellier	
	Undergraduate Research Advising	
	Matthew Bradley, UT Austin	2021 – current
Sarah Ortiz, UT Austin	2017 – 2019	
– Project title: <i>Testing potential for stable coexistence between two species, one capable of nitrogen fixation and one not</i>		
Lucile Jarry, Princeton University	2011 – 2012	
– Thesis title: <i>Inter- and intra-specific shifts in wood characteristics across the Midwestern rainfall gradient</i>		
Robin Eng, University of Pittsburgh	2011 – 2012	
– Project title: <i>Patterns of fungal diversity across a rainfall gradient</i>		
SERVICE AND OUTREACH	High School Research Initiative	Summer 2021
	<i>Designed and led a training for local high school teachers.</i>	
	Bridging Disciplines Mentor, UT Austin	2017 – 2019
	Theoretical Ecology Section of the Ecological Society of America, Student Presentation Judge	2016 – 2021
	NIMBioS Casual Seminar Series. Founder and organizer	2014 – 2016
	Adventures in STEM Camp. Volunteer. NIMBioS and Current	2015
	Planting Science Mentor. Online mentorship of high school students	2013 – 2014
	Guest speaker in Timberlane Middle School science classes. Pennington, NJ	2012
	Hopewell Elementary School Science Fair Judge. Hopewell, NJ	2010 – 2013
	Women in Science Graduate Mentor. Princeton, NJ	2008 – 2009
	Quest Program for New Jersey public school teachers. Princeton, NJ	2008
REVIEWER	<i>Journals:</i> American Naturalist, Biogeosciences, Ecology Letters, Ecological Modelling, Ecology, Geoscientific Model Development, Journal of Ecology, Nature Ecology and Evolution, New Phytologist, Oecologia, Plant and Soil, Proceedings of the National Academy of Sciences, Proceedings of the Royal Society B, and Theoretical Ecology.	
	<i>Funding Agencies:</i> National Science Foundation, US-Israel Binational Science Foundation, CONTEX.	
ADDITIONAL TRAINING	Complex Systems Summer School, Santa Fe Institute.	June 2009
	Probability Summer School, Cornell University.	June 2008
	Cedar Creek Ecosystem Science Reserve, Minnesota. Intern (Tilman).	Summers 2004, 2005, 2007
	Smithsonian Tropical Research Institute, Panama. Intern (Schnitzer and Muller-Landau).	Winter and Summer 2006